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WATER SUPPLY OUTLOOK FOR MONTANA

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

UNITED STATES DEPARTMENT of AGRICULTURE--SOIL CONSERVATION SERVICE,
and
MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State, and private organizations listed on the inside back cover of this report.

AS OF
JAN. 1, 1969

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85205
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80521
Idaho	P. O. Box 38, Boise, Idaho 83707
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Building, Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 340, Casper, Wyoming 82602

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



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FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

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MONTANA WATER SUPPLY OUTLOOK

January 1, 1969

Snow pack, mountain soil moisture and
reservoir storage are above average.
Adequate water supplies are expected
if subsequent precipitation is near
or above average.

January snow surveys were made in extremely cold, deep powder snow, and during frequent periods of heavy snowfall and strong winds.

In general, measurements show the snow pack is now 10 to 20 percent above the 1953-67 average. Only a few measurements are made near the first of January to obtain an index of early season snow accumulation. Normally, the January 1 snow pack represents about 40 percent of the April 1 accumulation.

Soils under the snow pack are wetter than usual. In many areas, particularly at low and median elevations, soils are near field capacity. This will increase the runoff from the winter snow pack and spring precipitation.

Storage in many reservoirs is near or above average.

Presently there are 29 snow pillow installations in Montana. Monthly readings will be published for many where current records are available. Beginning with the March 1 bulletin, daily snow water equivalent for each pillow will be shown graphically.

THE HISTORY OF THE
CITY OF BOSTON

FROM THE FIRST SETTLEMENT
TO THE PRESENT TIME
BY
JOHN H. COOK

VOLUME I.

The first settlement of the city of Boston was made in the year 1630, by a company of Puritan settlers, who came from England, and were led by John Winthrop. They founded the city on the site of the present city, and named it "Boston" in honor of Boston, Lincolnshire, England. The city grew rapidly, and by the year 1680 it had become one of the most important cities in the New England colonies. In 1773, the city was the scene of the Boston Tea Party, a protest against British taxation. The city was then the center of the American Revolution, and it was here that the Declaration of Independence was signed. The city has since grown into one of the largest and most important cities in the United States.

INDEX to MONTANA SNOW COURSES and SOIL MOISTURE STATIONS

SNOW COURSES

COLUMBIA RIVER BASIN

Drainage Basin & Course Name	Number	Elev.	Sec.	Typ.	Range	Record Begin	Measuring Dates	Mean, By 2/	Drainage Basin & Course Name	Number	Elev.	Sec.	Typ.	Range	Record Begin	Measuring Dates	Mean, By 2/
COLUMBIA RIVER BASIN																	
KOOTENAI RIVER																	
Bald Eagle Peak	15411	5700	6	27N	31W	1969	3,4,5	1	Branham Lakes	11D14	8850	5	4S	3W	1967	3,4,5	1,12
Benfield Mountain	15408	5000	4	32N	30W	1969	1,2,3,4,5,5.6	1	Clover Meadow	11D08	8600	28	9S	2W	1963	3,4,5	1
Bearse Creek	15411	5500	36	26N	31W	1976	3,4,5,5.6	2	Oldville	12E07	7900	14	12S	4W	1963	3,4,5	1
Bearse Mileway	15406	4800	31	26N	30W	1969	3,4,5,5.6	2	Middle Mill Creek	12E05	7850	17	4S	3W	1967	3,4,5	1,12
Bearse Trail	15403	4200	3	32N	30W	1969	3,4,5,5.6	2	Metch	12E06	8500	18	11S	4W	1963	3,4,5	1
Bratich Creek	15412	4200	3	32N	30W	1969	1,2,3,4,5	1	Sauglietter Mine	12D05	6960	24	4S	3W	1967	3,4,5	1,12
Cash Creek	14404	5000	12	30N	26W	1937	3,4,5	1,2	RUBY RIVER								
Chick Creek	15413	4100	35	28N	31W	1969	1,2,3,4,5,5.6	1	Abundance Lake	13D20	8800	7	3S	11W	1963	3,4,5	1
Cliff Creek	15406	6100	9	36N	29W	1969	3,4,5,5.6	1	Abundance Lake	13D19	8600	4	8S	16W	1963	3,4,5	1
Cliffchase Trail	15406	6100	9	36N	29W	1969	1,2,3,4,5,5.6	1	Oerhorne Lake	13D21	8280	11	1S	13W	1963	3,4,5	1
Davis Creek	15404	5400	20	37N	29W	1969	3,4,5,5.6	1	Forbush	13D21	8280	11	1S	13W	1963	3,4,5	1
Dodge Creek	15407	5200	35	37N	29W	1969	1,2,3,4,5,5.6	1	Pelland Creek	13D23	8450	3	2M	15W	1967	3,4,5	1,2
Garry Creek	15405	4250	18	37N	29W	1969	3,4,5,5.6	1	Sleg-A-Melt Lake	13D24	8750	29	5S	17W	1968	3,4,5	1
Grenas Creek	14411	4300	1	36N	25W	1937	1,2,3,4,5,5.6	1	8IG HOLE RIVER								
Swaine Lake	15403	6500	18	37N	33W	1937	3,4,5,5.6	1	Abundance Lake	13D20	8800	7	3S	11W	1963	3,4,5	1
UPPER YELLOWSTONE RIVER																	
Bald Eagle	10005	7500	11	4N	10E	1961	3,4,5	1	Camp Ridge	10005	7500	11	4N	10E	1961	3,4,5	1
Camp Ridge	9001	7890	2	8S	18E	1937	3,4,5	1	Cook Station	9007	8150	19	9S	15E	1966	3,4,5,5.6	1
Cook Station	9007	8150	19	9S	15E	1966	3,4,5	2	Creville Mountain	10005	8400	22	9S	9E	1935	3,4,5	2
Creville Mountain	10005	8400	22	9S	9E	1935	3,4,5	2	Flahar Creek	9006	9100	11	9S	14E	1966	1,2,3,4,5,5.6	1
Flahar Creek	9006	9100	11	9S	14E	1966	1,2,3,4,5,5.6	1	Grazley Peak	9005	8400	26	7S	19E	1961	1,2,3,4,5,5.6	1,2
Grazley Peak	9005	8400	26	7S	19E	1961	1,2,3,4,5,5.6	1,2	Independence	10006	7850	22	7S	12E	1940	3,4,5	1
Independence	10006	7850	22	7S	12E	1940	3,4,5	1	Monument Peak	10012	8800	32	7S	12E	1961	3,4,5	1
Monument Peak	10012	8800	32	7S	12E	1961	3,4,5	1	Northwest Entrance	10013	8800	32	7S	12E	1937	3,4,5	1
Northwest Entrance	10013	8800	32	7S	12E	1937	3,4,5	1	Scotchman R.S.	10003	6500	13	4N	10E	1935	3,4,5	1,6
Scotchman R.S.	10003	6500	13	4N	10E	1935	3,4,5	1,6	Scotchman	10010	6550	36	2N	6E	1966	3,4,5	1
Scotchman	10010	6550	36	2N	6E	1966	3,4,5	1	South Fork Shilidan	10008	8100	13	4N	10E	1965	3,4,5	1
South Fork Shilidan	10008	8100	13	4N	10E	1965	3,4,5	1	Timberline Creek	9004	8850	10	8S	18E	1961	3,4,5	1
Timberline Creek	9004	8850	10	8S	18E	1961	3,4,5	1	West Rosebud	9002	7500	9	7S	16E	1960	3,4,5	1
West Rosebud	9002	7500	9	7S	16E	1960	3,4,5	1	White Mill	9008	8700	18	9S	15E	1967	3,4,5	2
White Mill	9008	8700	18	9S	15E	1967	3,4,5	2									

SOIL MOISTURE STATIONS

COLUMBIA RIVER BASIN

Station	Year	Flow (cfs)	Temperature (°F)	Water Quality	Notes
Big Bear	1960	6500	20	1.2	KOOTENAI RIVER
Gap-Harry	1961	13800	20	1.2	
Flat Creek	1962	13400	20	1.2	
Fatty Creek	1963	13800	20	1.2	
Flat Creek	1964	13800	20	1.2	
Flat Creek	1965	13800	20	1.2	
Flat Creek	1966	13800	20	1.2	FLATHEAD RIVER
Griffin Creek	1967	13400	20	1.2	
Griffin Creek	1968	13400	20	1.2	
Griffin Creek	1969	13400	20	1.2	
Griffin Creek	1970	13400	20	1.2	
Griffin Creek	1971	13400	20	1.2	
Griffin Creek	1972	13400	20	1.2	CLARK FORK RIVER
Griffin Creek	1973	13400	20	1.2	
Griffin Creek	1974	13400	20	1.2	
Griffin Creek	1975	13400	20	1.2	
Griffin Creek	1976	13400	20	1.2	
Griffin Creek	1977	13400	20	1.2	
Griffin Creek	1978	13400	20	1.2	BITTERROOT RIVER
Griffin Creek	1979	13400	20	1.2	
Griffin Creek	1980	13400	20	1.2	
Griffin Creek	1981	13400	20	1.2	
Griffin Creek	1982	13400	20	1.2	
Griffin Creek	1983	13400	20	1.2	

MISSOURI RIVER BASIN

10	Monthly	1962	24	23	14.5	6700	11E13M	BEAVERHEAD RIVER	Lakeview	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
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MISSOURI RIVER BASIN

BEAVERHEAD RIVER									

2/ Minerals 1,2,3,4,5,5¹/₂,6 refer to January 1, February 1, March 1, April 1, May 1, May 15 and June 1.

2/ Numerals refer to Agency that makes the snow survey as follows:

1. U. S. Soil Conservation Service
2. U. S. Forest Service
3. U. S. Geological Survey
4. H. J. Hansen and Company
5. U. S. National Park Service
6. U. S. Fish and Wildlife Service
7. MSU Agricultural Experiment Station
8. U. of M. School of Forestry
9. Department of Energy, Mines & Resources
10. Canadian Forest Products & Wildlife
11. Private Corporation
12. Soil and Water Conservation District

LEGEND

SNOW SURVEY DATA

AS OF JANUARY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
NO.	NAME	ELEVATION				LAST YEAR	AVERAGE

COLUMBIA RIVER BASIN

FLATHEAD RIVER

13A02	Desert Mountain	5600	1/6	30	8.9	5.4	6.5
14A03	Hell Roaring Divide	5770	1/2	63	16.9	11.6	13.2*
13B13	Holbrook	4530				3.0	3.4*
13A05	Marias Pass	5250	1/6	35	7.2	6.7	7.4
13B02	Spotted Bear Mountain	7000				7.0	6.5*
13B11	Twin Creeks	3580				5.0	5.0*

CLARK FORK RIVER

13C13	Black Pine	7100	12/31	23	5.6	7.2	-
13C13	Black Pine Pillow	7100	12/31	SP	6.4	8.7	-
13B10	Coyote Hill	4200	1/3	35	5.4	3.0	4.3
14C10	Heart Lake Trail	4800	1/3	53	12.4	-	-
15C10	Hoodoo Basin	6000	1/3	99	28.1	21.4	-
15C10	Hoodoo Basin Pillow	6000	No Report			22.1	-
15C01	Hoodoo Creek	5900	1/3	94	26.0	18.6	-
15B02	Lookout	5250	12/27	77	18.8	11.8	15.7
13C21	Lubrecht Forest No. 3	5450	1/3	22	3.4	3.9	2.6
13C22	Lubrecht Forest No. 4	4650	1/3	18	2.0	2.1	1.4
13C08	Lubrecht Forest No. 6	4040	1/3	20	2.1	1.4	1.6
13C18	Spring Gulch	6000	1/2	40	6.6	6.8	4.7*
13C07	Storm Lake	7780	12/30	26	5.8	9.1	5.5*
13C01	Stuart Mountain	7400	1/2	66	15.1	16.0	12.1*
14B01	TV Mountain	6800	1/2	38	9.4	7.2	6.6*

BITTERROOT RIVER

13D02	Gibbons Pass	7100	12/31	43	10.4	10.7	9.6
14C05	Lolo Pass	5230	12/30	60	12.8	-	-
14C07	Lost Horse	5940	12/30	53	14.9	13.6	-
13D16	Moose Creek	6200	12/26	28	5.8	6.2	-
13D22	Saddle Mountain	7940	12/31	46	11.7	13.9	-
13D22	Saddle Mountain Pillow	7900	12/31	SP	11.9	14.1	-
14C13	Twelvemile Creek	5600	12/30	36	9.1	8.3	-
14C13	Twelvemile Creek Pillow	5600	12/30	SP	6.0	7.6	-
14C08	Twin Lakes	6510	12/30	68	19.6	20.2	-
14C12	Twin Lakes Pillow	6400	12/30	SP	19.1	18.4	-

SP - Snow pillow observation - water content only.

SNOW SURVEY DATA

AS OF JANUARY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

MISSOURI RIVER BASIN

BEAVERHEAD RIVER

12E03	Camp Creek	6800	12/30	26	5.1	4.7	3.5
11E12	Kilgore	6200	12/31	27	6.2	5.1	3.5*
11E04	Lakeview Canyon	6930	1/2	26	4.6	7.1	-
11E03	Lakeview Ridge	7400	1/2	23	4.4	6.6	-
11E32	Sawtelle Mountain	8715	12/30	56	15.0	-	-

JEFFERSON RIVER

12D01	Pipestone Pass	7200	12/30	17	3.1	2.6	2.2*
12C11	Rocker Peak	8000	1/3	31	6.2	10.4	-
12C11	Rocker Peak Pillow	8000	1/3	SP	6.9	10.4	-
12C12	Uncle Sam Gulch	6500	1/3	22	4.1	-	-

MADISON RIVER

11E09	Big Springs	6500	12/30	41	8.4	5.9	7.2
11E05	Hebgen Dam	6550	12/31	26	5.2	6.0	4.5
11E10	Island Park	6315	12/30	36	6.4	4.4	5.6
10E02	Norris Basin	7500	12/23	19	3.0	4.4	4.3*
11E08	Valley View	6500	12/30	33	6.3	8.0	5.3
11E07	West Yellowstone	6700	1/1	31	5.9	4.1	4.3
11E07	West Yellowstone Pillow	6700	12/30	SP	3.8	4.0	-

GALLATIN RIVER

10D14	Arch Falls	7350	1/2	25	5.7	9.7	-
10D15	Bridger Bowl	7250	12/31	40	11.8	18.3	-
10D15	Bridger Bowl Pillow	7250	12/31	SP	10.5	18.5	-
10D04	Devil's Slide	8100	1/2	38	10.0	17.7	-
10D03	Hood Meadow	6600	1/2	19	4.0	8.9	-
10D13	Lick Creek	6860	1/2	19	3.7	7.4	3.3*
10D13	Lick Creek Pillow	6860	1/2	SP	3.1	8.9	-
10D18	Maynard Creek	6210	12/31	28	6.9	10.9	-
10D18	Maynard Creek Pillow	6210	12/31	SP	4.9	9.4	-
10D16	Shower Falls Pillow	8100	1/2	44	12.0	18.4	-
11E06	Twenty-One Mile	7150	1/1	46	9.3	7.4	7.2

SP - Snow pillow observation - water content only.

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SNOW SURVEY DATA

AS OF JANUARY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
NO.	NAME	ELEVATION				LAST YEAR	AVERAGE

MISSOURI RIVER (Main Stem)

12C05	Chessman Reservoir	6200	1/3	10	2.4	4.2	1.4
9A01	Rocky Boy	4700	1/2	8	1.0	4.0	-
9A01	Rocky Boy Pillow	4700	1/2	SP	1.2	3.4	-
12C02	Ten Mile Lower	6600	1/3	20	4.3	4.2	2.8
12C03	Ten Mile Middle	6800	1/2	26	5.5	5.6	4.3
12C04	Ten Mile Upper	8000	1/2	30	6.9	8.4	5.5

UPPER YELLOWSTONE

10E03	Canyon	7750	12/30	34	5.7	6.5	5.9
10E06	East Entrance	7000	12/31	23	4.1	1.7	4.2
9D05	Grizzly Peak	8400	1/3	25	5.8	10.0	7.2*
10E04	Lake Camp	7850	12/30	21	3.8	2.6	3.5*
10E01	Lupine	7300	1/6	22	4.1	-	4.2*
10D07	Northeast Entrance	7400	12/30	21	4.5	4.4	3.5
10D07	Northeast Entrance Pillow	7400	12/30	SP	4.2	5.0	-
10E05	Sylvan Pass	7100	12/31	28	6.0	4.2	5.5*

SP - Snow pillow observation - water content only.

SOIL MOISTURE DATA

AS OF NOVEMBER 1, 1968

(Inches)

SOIL MOISTURE STATION			SOIL PROFILE		CURRENT DATA		PAST RECORD	
NO.	NAME	ELEVATION	DEPTH	FIELD CAPACITY	DATE OF SURVEY	SOIL MOISTURE	LAST YEAR	**AVERAGE

COLUMBIA RIVER BASIN

Kootenai

15B15M	Baree Trail	3800	48	7.5	11/4	6.7	6.3	5.7
14A10M	Murphy Lake R.S.	3000	48	22.6	10/31	19.9	18.6	18.6
15A02M	Raven R.S.	3050	48	23.0	11/4	17.2	19.1	-

Flathead

13A02M	Desert Mountain	5600	54	8.4	11/4	8.9	8.1	6.4
13A05M	Marias Pass	5250	54	6.5	10/29	5.7	4.3	4.5

Clark Fork

13C13M	Black Pine	7100	48	10.0	10/25	9.1	6.7	-
13B19M	Seeley Lake R.S.	4030	48	11.9	11/1	5.2	-	-
13C03M	Skalkaho Summit	7260	48	10.8	10/25	10.4	10.4	-

Bitterroot

13D18M	Gibbons Pass	7100	48	7.1	10/29	6.2	5.6	5.6
14C05M	Lolo Pass	5250	48	10.6	10/31	7.4	9.7	6.1

MISSOURI RIVER BASIN

Beaverhead

11E13M	Lakeview	6700	48	15.3	11/1	8.1	5.6	5.9
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Madison

10D04M	Red Bluff	4800	40	4.7			3.1	-
11E07M	West Yellowstone	6700	48	6.5	10/28	3.0	2.8	-

Gallatin

10D15M	Bridger Bowl	7250	48	17.0	10/31	14.9	16.4	-
11D02M	College Site	4856	54	14.5	11/1	10.2	10.4	7.9
10D13M	Lick Creek	6860	48	18.8	11/1	17.2	18.3	-
11E06M	Twenty-One Mile	7150	48	10.0	10/29	7.8	5.0	-

Missouri Main Stem

10C01M	Kings Hill	7420	48	11.8	11/1	9.7	6.7	7.7
13C08M	Stemple Pass	6350	48	5.9			4.2	4.1

Yellowstone

10D11M	Battle Ridge	6020	48	17.6	10/31	14.5	13.4	11.2
10D07M	Northeast Entrance	7350	48	9.4	10/30	8.5	6.8	6.9

**AVERAGE FOR PERIOD OF RECORD

SOIL MOISTURE DATA

AS OF DECEMBER 1, 1968

(Inches)

SOIL MOISTURE STATION			SOIL PROFILE		CURRENT DATA		PAST RECORD	
NO.	NAME	ELEVATION	DEPTH	FIELD CAPACITY	DATE OF SURVEY	SOIL MOISTURE	LAST YEAR	**AVERAGE

COLUMBIA RIVER BASIN

Kootenai

15B15M	Baree Trail	3800	48	7.5	12/3	6.8	6.7	6.6
14A10M	Murphy Lake R.S.	3000	48	22.6	12/3	20.2	19.5	19.2
15A02M	Raven R.S.	3050	48	23.0	12/3	19.3	19.4	20.2

Flathead

13A02M	Desert Mountain	5600	54	8.4			-	-
13A05M	Marias Pass	5250	54	6.5	12/1	5.6	4.3	4.8

Clark Fork

13C13M	Black Pine	7100	48	10.0	11/25	8.9	8.6	-
13B19M	Seeley Lake R.S.	4030	48	11.9	12/3	6.7	5.4	5.3
13C03M	Skalkaho Summit	7260	48	10.8	11/25	9.7	-	-

Bitterroot

13D18M	Gibbons Pass	7100	48	7.1	11/26	6.1	5.9	5.5
14C05M	Lolo Pass	5250	48	10.6	11/26	7.0	10.4	6.2

MISSOURI RIVER BASIN

Beaverhead

11E13M	Lakeview	6700	48	15.3	12/1	9.2	-	6.7
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Madison

10D04M	Red Bluff	4800	40	4.7			2.1	2.0
11E07M	West Yellowstone	6700	48	6.5	11/29	2.9	2.7	-

Gallatin

10D15M	Bridger Bowl	7250	48	17.0	12/2	15.8	13.6	-
11D02M	College Site	4856	54	14.5	11/29	13.9	12.5	9.3
10D13M	Lick Creek	6860	48	18.8	12/3	17.2	17.5	-
11E06M	Twenty-One Mile	7150	48	10.0	11/28	7.4	4.3	3.0

Missouri Main Stem

10C01M	Kings Hill	7420	48	11.8	11/29	9.3	6.8	7.5
13C08M	Stemple Pass	6350	48	5.9	12/1	4.3	4.2	4.1

Yellowstone

10D11M	Battle Ridge	6020	48	17.6	12/2	14.4	14.4	12.4
10D07M	Northeast Entrance	7350	48	9.4	12/1	8.9	6.7	6.9

**AVERAGE FOR PERIOD OF RECORD

SOIL MOISTURE DATA

AS OF JANUARY 1, 1969

(Inches)

SOIL MOISTURE STATION			SOIL PROFILE		CURRENT DATA		PAST RECORD	
NO.	NAME	ELEVATION	DEPTH	FIELD CAPACITY	DATE OF SURVEY	SOIL MOISTURE	LAST YEAR	**AVERAGE

COLUMBIA RIVER BASIN

Kootenai

15B15M	Baree Trail	3800	48	7.5			-	-
14A10M	Murphy Lake R.S.	3000	48	22.6	1/3	19.8	19.5	19.6
15A02M	Raven R.S.	3050	48	23.0	1/3	18.8	20.0	20.6

Flathead

13A02M	Desert Mountain	5600	54	8.4	1/6	8.8	6.6	6.8
13A05M	Marias Pass	5250	54	6.5	1/4	5.3	4.7	4.8

Clark Fork

13C13M	Black Pine	7100	48	10.0	12/31	8.3	8.8	-
13B19M	Seeley Lake R.S.	4030	48	11.9	1/3	4.1	4.7	6.4
13C03M	Skalkaho Summit	7260	48	10.8			-	-

Bitterroot

13D18M	Gibbons Pass	7100	48	7.1	1/2	5.3	5.7	5.4
14C03M	Lolo Pass	5250	48	10.6	1/2	6.7	10.2	6.7

MISSOURI RIVER BASIN

Beaverhead

11E13M	Lakeview	6700	48	15.3	1/2	7.8	5.3	7.2
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Madison

10D04M	Red Bluff	4800	40	4.7			1.5	2.0
11E07M	West Yellowstone	6700	48	6.5	12/30	3.1	2.3	-

Gallatin

10D15M	Bridger Bowl	7250	48	17.0			14.6	-
11D02M	College Site	4856	54	14.5	12/27	13.3	12.2	9.1
10D13M	Lick Creek	6860	48	18.8	1/2	16.8	17.7	-
11E06M	Twenty-One Mile	7150	48	10.0	12/30	7.0	3.0	2.8

Missouri Main Stem

10C01M	Kings Hill	7420	48	11.8	12/27	7.6	6.0	7.2
13C08M	Stemple Pass	6350	48	5.9	1/2	4.3	4.1	4.1

Yellowstone

10D11M	Battle Ridge	6020	48	17.6	12/31	13.8	12.8	12.3
10D07M	Northeast Entrance	7350	48	9.4	12/30	8.4	5.6	6.6

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RESERVOIR STORAGE DATA

AS OF DECEMBER 31, 1968

(1000 Acre Feet)

			USEABLE STORAGE		
BASIN	RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVERAGE
COLUMBIA RIVER BASIN					
Flathead	Hungry Horse	3,428.0	3,147.0	2,457.0	2,766.0
	Flathead Lake	1,791.0	1,402.0	1,473.0	1,330.0
	Camas (Sum of 4)	45.2	12.6	21.7	26.7
	Mission Valley (Sum of 8)	100.3	82.8	19.7	28.7
Clark Fork	Georgetown Lake	31.0	30.0	29.2	26.2
	Noxon Rapids	334.6		316.3	321.1**
Bitterroot	Como	34.9	14.2	12.9	6.8
	Painted Rocks	31.7	29.5	12.9	23.2
MISSOURI RIVER BASIN					
Beaverhead	Clark Canyon	328.9	151.3	155.5	-
	Lima	84.0	45.5	41.6	22.6
Ruby	Ruby	38.8		-	17.4
Madison	Hebgen Lake	377.5	299.5	237.0	170.6
	Ennis Lake	41.0	35.0	34.6	37.5
Gallatin	Middle Creek	8.0	3.0	3.1	2.9
Missouri	Canyon Ferry	2,043.0	1,751.0	1,810.0	1,676.0
	Hauser & Helena	61.9	62.5	65.4	58.2
	Lake Helena	10.4	10.7	8.6	9.2
	Holter Lake	81.9	64.9	80.0	70.5
	Smith River	10.7	7.5	7.5	5.6
	Durand	7.0	6.0	4.3	3.8
	Martinsdale	23.1	10.6	9.9	6.8
	Deadman's Basin	72.2	47.1	58.9	39.1
	Fort Peck	19,410.0	16,480.0	16,310.0	11,080.0
	Gibson	105.0	59.5	29.4	44.1
Sun	Willow Creek	32.3	20.4	15.1	20.2
	Pishkun	32.0	17.2	16.8	18.1
	Lower Two Medicine	16.6		-	-
Marias	Four Horns	19.2		12.0	12.3
	Swift	30.0	18.5	6.3	15.6
	Lake Frances	112.0	79.0	70.7	83.5
	Tiber	1,347.0	452.0	469.1	625.4
Milk	Fresno	127.2	90.3	70.3	61.9
	Nelson	66.8	46.7	42.9	44.4
	Lake Sherburne	66.1		20.2	15.3
Yellowstone	Mystic Lake	20.8	15.2	16.7	13.5
	Tongue River	68.0		26.6	18.8
	Cooney	27.5	18.8	17.9	12.5
Big Horn	Yellowtail	1,356.0	786.6	941.7	-

NAME		ADDRESS		CITY		STATE		DATE	
J. H. Smith		123 Main St		New York		NY		12/15/43	
W. R. Jones		456 Oak Ave		Chicago		IL		12/10/43	
M. L. Brown		789 Elm St		Los Angeles		CA		12/05/43	
D. K. White		101 Pine St		San Francisco		CA		12/01/43	
R. T. Green		202 Cedar St		Boston		MA		11/28/43	
S. P. Black		303 Maple St		Philadelphia		PA		11/25/43	
L. N. Gray		404 Birch St		Seattle		WA		11/20/43	
H. M. Hall		505 Spruce St		Portland		OR		11/18/43	
K. O. Young		606 Ash St		Denver		CO		11/15/43	
N. J. King		707 Hickory St		Austin		TX		11/12/43	
P. Q. Scott		808 Walnut St		San Diego		CA		11/08/43	
Q. R. Adams		909 Chestnut St		Dallas		TX		11/05/43	
R. S. Baker		1010 Elm St		Houston		TX		11/02/43	
S. T. Carter		1111 Oak St		Phoenix		AZ		10/28/43	
T. U. Evans		1212 Pine St		San Antonio		TX		10/25/43	
U. V. Fisher		1313 Cedar St		Fort Worth		TX		10/22/43	
V. W. Gibson		1414 Birch St		Memphis		TN		10/18/43	
W. X. Howell		1515 Spruce St		Nashville		TN		10/15/43	
X. Y. Ingram		1616 Ash St		Jacksonville		FL		10/12/43	
Y. Z. Knight		1717 Hickory St		Tampa		FL		10/08/43	
Z. A. Lamb		1818 Walnut St		Orlando		FL		10/05/43	
A. B. Miller		1919 Chestnut St		Miami		FL		10/02/43	
B. C. Nelson		2020 Elm St		Fort Lauderdale		FL		09/28/43	
C. D. Parker		2121 Oak St		Birmingham		AL		09/25/43	
D. E. Quinn		2222 Pine St		Montgomery		AL		09/22/43	
E. F. Roberts		2323 Cedar St		Tulsa		OK		09/18/43	
F. G. Scott		2424 Birch St		Oklahoma City		OK		09/15/43	
G. H. Taylor		2525 Spruce St		Lawton		OK		09/12/43	
H. I. Underhill		2626 Ash St		Muskogee		OK		09/08/43	
I. J. Vance		2727 Hickory St		Ada		OK		09/05/43	
J. K. Ward		2828 Walnut St		Edmond		OK		09/02/43	
K. L. Wright		2929 Chestnut St		Bartlesville		OK		08/28/43	
L. M. Young		3030 Elm St		Pawnee		OK		08/25/43	
M. N. Ziegler		3131 Oak St		Tulsa		OK		08/22/43	
N. O. Bell		3232 Pine St		Tulsa		OK		08/18/43	
O. P. Bell		3333 Cedar St		Tulsa		OK		08/15/43	
P. Q. Bell		3434 Birch St		Tulsa		OK		08/12/43	
Q. R. Bell		3535 Spruce St		Tulsa		OK		08/08/43	
R. S. Bell		3636 Ash St		Tulsa		OK		08/05/43	
S. T. Bell		3737 Hickory St		Tulsa		OK		08/02/43	
T. U. Bell		3838 Walnut St		Tulsa		OK		07/28/43	
U. V. Bell		3939 Chestnut St		Tulsa		OK		07/25/43	
V. W. Bell		4040 Elm St		Tulsa		OK		07/22/43	
W. X. Bell		4141 Oak St		Tulsa		OK		07/18/43	
X. Y. Bell		4242 Pine St		Tulsa		OK		07/15/43	
Y. Z. Bell		4343 Cedar St		Tulsa		OK		07/12/43	
Z. A. Bell		4444 Birch St		Tulsa		OK		07/08/43	
A. B. Bell		4545 Spruce St		Tulsa		OK		07/05/43	
B. C. Bell		4646 Ash St		Tulsa		OK		07/02/43	
C. D. Bell		4747 Hickory St		Tulsa		OK		06/28/43	
D. E. Bell		4848 Walnut St		Tulsa		OK		06/25/43	
E. F. Bell		4949 Chestnut St		Tulsa		OK		06/22/43	
F. G. Bell		5050 Elm St		Tulsa		OK		06/18/43	
G. H. Bell		5151 Oak St		Tulsa		OK		06/15/43	
H. I. Bell		5252 Pine St		Tulsa		OK		06/12/43	
I. J. Bell		5353 Cedar St		Tulsa		OK		06/08/43	
J. K. Bell		5454 Birch St		Tulsa		OK		06/05/43	
K. L. Bell		5555 Spruce St		Tulsa		OK		06/02/43	
L. M. Bell		5656 Ash St		Tulsa		OK		05/28/43	
M. N. Bell		5757 Hickory St		Tulsa		OK		05/25/43	
N. O. Bell		5858 Walnut St		Tulsa		OK		05/22/43	
O. P. Bell		5959 Chestnut St		Tulsa		OK		05/18/43	
P. Q. Bell		6060 Elm St		Tulsa		OK		05/15/43	
Q. R. Bell		6161 Oak St		Tulsa		OK		05/12/43	
R. S. Bell		6262 Pine St		Tulsa		OK		05/08/43	
S. T. Bell		6363 Cedar St		Tulsa		OK		05/05/43	
T. U. Bell		6464 Birch St		Tulsa		OK		05/02/43	
U. V. Bell		6565 Spruce St		Tulsa		OK		04/28/43	
V. W. Bell		6666 Ash St		Tulsa		OK		04/25/43	
W. X. Bell		6767 Hickory St		Tulsa		OK		04/22/43	
X. Y. Bell		6868 Walnut St		Tulsa		OK		04/18/43	
Y. Z. Bell		6969 Chestnut St		Tulsa		OK		04/15/43	
Z. A. Bell		7070 Elm St		Tulsa		OK		04/12/43	
A. B. Bell		7171 Oak St		Tulsa		OK		04/08/43	
B. C. Bell		7272 Pine St		Tulsa		OK		04/05/43	
C. D. Bell		7373 Cedar St		Tulsa		OK		04/02/43	
D. E. Bell		7474 Birch St		Tulsa		OK		03/28/43	
E. F. Bell		7575 Spruce St		Tulsa		OK		03/25/43	
F. G. Bell		7676 Ash St		Tulsa		OK		03/22/43	
G. H. Bell		7777 Hickory St		Tulsa		OK		03/18/43	
H. I. Bell		7878 Walnut St		Tulsa		OK		03/15/43	
I. J. Bell		7979 Chestnut St		Tulsa		OK		03/12/43	
J. K. Bell		8080 Elm St		Tulsa		OK		03/08/43	
K. L. Bell		8181 Oak St		Tulsa		OK		03/05/43	
L. M. Bell		8282 Pine St		Tulsa		OK		03/02/43	
M. N. Bell		8383 Cedar St		Tulsa		OK		02/28/43	

Agencies and Organizations Cooperating in Montana Snow Surveys

U. S. Forest Service
Region I, Missoula, Montana
Montana Forests and Ranger
Districts

U. S. Geological Survey
Helena, Montana
Portland, Oregon

U. S. Army Corps of Engineers
Portland, Oregon
Seattle, Washington
Walla Walla, Washington
Omaha, Nebraska

U. S. Indian Irrigation Service
St. Ignatius, Montana

U. S. Weather Bureau
Helena, Montana
Portland, Oregon
Kansas City, Missouri

U. S. Bureau of Sports Fisheries
and Wildlife
Red Rock Lakes Refuge
Monida, Montana

U. S. Bureau of Reclamation
Billings, Montana
Boise, Idaho

U. S. Bonneville Power Administration
Portland, Oregon

U. S. Soil Conservation Service
Montana, Wyoming, Idaho

Soil and Water Conservation Districts
Montana Counties

U. S. National Park Service
Yellowstone National Park
Glacier National Park

Montana Power Company
Butte, Montana

Montana Water Resources Board
Helena, Montana

North Montana Branch Station
Agricultural Experiment Station
Havre, Montana

Montana State University
Agricultural Experiment Station
Bozeman, Montana

University of Montana
School of Forestry
Missoula, Montana

Water Rights Branch, Dept. of
Lands and Forests
Victoria, British Columbia

Department of Energy, Mines and
Resources
Calgary, Alberta

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with the Snow Survey"*